Tech Fact Sheet

Savannah River National Laboratory ***South Carolina***

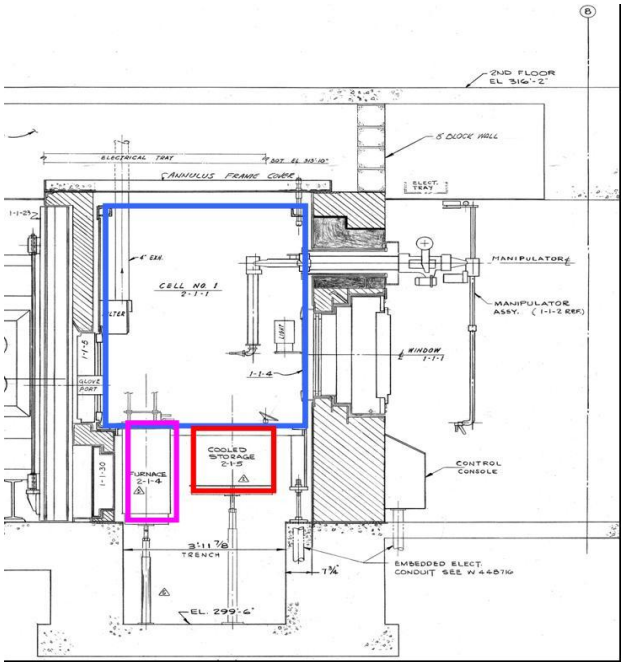
Capturing Process Knowledge for Facility Deactivation and Decommissioning

Challenge

The Office of Environmental Management (EM) is responsible for the disposition of a vast number of facilities at numerous sites around the country which have been declared excess to current mission needs. When such excess facilities are scheduled for deactivation and decommissioning (D&D), among the tasks the responsible project team is faced with include the evaluation and planning for the removal, characterization, and disposition of all legacy materials and process equipment. The D&D project team must conduct an effective and diligent search for information resulting in a robust body of process knowledge for the facilities thus minimizing programmatic risk and enhancing the protection the health and safety of the EM work force. However, the challenge faced by D&D project teams, and the DOE personnel responsible to conduct independent reviews of facility D&D projects, is the ability to create this robust body of PK given the shrinking of institutional memory, which is part of an aging work force, and the limited D&D contractor experience with EM's facilities.

Technical Solution

In addressing the challenge the general field of knowledge management (KM) was surveyed with the goal of identifying KM strategies that can be implemented by D&D project teams to manage the acquisition of PK. Lines of Inquiry (LOI) were developed to assess how various organizations in the DOE complex acquire and use PK for D&D projects which were sent to several DOE sites for comment. Responses were received from Hanford, the Savannah River Site (SRS) and the Paducah Gaseous Diffusion Plant and phone discussions were held with personnel at several sites. Sandia National Lab (SNL) and Lawrence Livermore National Lab provided copies of documents that govern their PK data gathering procedure and SNL was visited to discuss their procedure in greater detail. Finally, the PK management practices of the Department of Defense and the commercial nuclear industry were surveyed. Several Electric Power Research Institute documents which address the issue of PK management were reviewed. These efforts resulted in the development of guidance for D&D projects to use for the management and systematic development of a defendable PK for the project.



Sectional of Hot Cell in Pu-238 Process Facility

Site Project & Identifier	Tech Stage: Tech Assistance
Savannah River National Laboratory- Assess Adequacy of Process Knowledge for D&D	Guidance for Determining Adequacy of Process Knowledge

Tech Accomplishment

Key design documents of process facilities have been found useful to D&D project teams. The following categories of documents are recommended to be collected and made available to members of the project team to perform their individual functions:

- Process and Instrumentation Diagrams
- Process Flow Diagrams
- Equipment Arrangements
- Specifications for Materials and Process Equipment
- Master Equipment List
- Line List
- System Design Description
- Equipment Vendor Documents
- Operations Training Manuals
- Safety Basis Documents

The following process history documents are recommended for review by the D&D project team.

- Records of nuclear and chemical materials used or stored
- Records of spills and leaks
- Records of on-site disposals, if any
- Deactivation final report
- Surveillance and maintenance (S&M) plan
- Production reports
- S&M records and annual reports
- Lessons learned reports
- DOE Occurrence Reporting and Processing System database events for the facility
- Technical reports related to process development or performance
- Results of interviews with people knowledgeable of facility history
- Radiological surveys during the life of the facility
- Historical aerial photographs
- Control room operating logs
- MC&A reports
- Facility condition reports or assessments

Impact

This guidance provides DOE-EM D&D contractors with guidance for developing the robust body of the PK needed to D&D of excess facilities. This guidance is also useful to independent project reviewers who must evaluate the body of PK actually assembled by project execution teams to determine its adequacy to allow the project to proceed with minimum technical and programmatic risk. D&D projects that proceed with inadequate project knowledge run the risk of exposing workers to unexpected process hazards, leading to injuries, schedule delays and cost increases. By following the guidance, these risks can be reduced and result in safer, better-managed projects.

Impact and Features

- The guidance recommends that, early on, D&D projects establish a formal PK management program with a central document repository accessible by all team members. Following this guidance will improve productivity of project personnel.
- Recommendations for the types of useful process history documents are provided. Collecting these documents will improve the safety of process system de-inventory and improve waste characterization.
- Recommendations for the types of useful process design documents are provided. Collecting these documents will improve the efficiency of D&D activities.

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Challenge Category	Tech Solution Category
• Characterization • Decontamination • Deactivation	• Characterization • Decontamination • Deactivation